

TENTATIVE

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD CENTRAL VALLEY REGION

ORDER NO. R5-2008-_____

NPDES NO. CAS082597

FACT SHEET

CITIES OF CITRUS HEIGHTS, ELK GROVE, FOLSOM, GALT, RANCHO CORDOVA SACRAMENTO AND COUNTY OF SACRAMENTO STORM WATER DISCHARGES FROM MUNICIPAL SEPARATE STORM SEWER SYSTEM SACRAMENTO COUNTY

I. PURPOSE

The Regional Water Quality Control Board, Central Valley Region (Regional Water Board) will be considering adoption of a renewal of the County of Sacramento and the cities of Citrus Heights, Elk Grove, Folsom, Galt, Rancho Cordova and Sacramento Municipal Separate Storm Sewer System NPDES Permit (hereinafter referred to as Permit). The purpose of this Fact Sheet is to give the Permittees and interested parties an overview of the Permit as well as to provide the regulatory, technical and background basis for the Permit requirements. Sections II through IV describe water quality problems from storm water and urban runoff, and Permit conditions designed to address these problems. Sections V and VI discuss each major element of the permittees' storm water management plans (referred to as Storm Water Quality Improvement Plans (SQIPs) by the Permittees). The SQIPs will be adopted by the Regional Water Board and are considered an integral and enforceable component of the proposed Permit.

The proposed Permit specifies requirements necessary for the Permittees to reduce the discharge of pollutants in urban runoff to the maximum extent practicable (MEP). However, since compliance with the MEP standard is an iterative process, the Permittees' storm water programs must continually be assessed and modified as urban runoff management knowledge increases, to incorporate improved programs, control measures, best management practices (BMPs), etc. in order to achieve the MEP standard. This iterative process of continual assessment, revision, and improvement of storm water management program implementation is expected to achieve compliance with water quality standards.

II. THE NEED TO REGULATE STORM WATER DISCHARGES

A. Impacts

The quality of storm water and urban runoff are fundamentally important to the health of the environment and the quality of life in the Central Valley Region. Polluted storm water runoff is a leading cause of water quality impairment in the Sacramento area, as well as other potential sources as aerial deposition and runoff from sources outside the urban area. Storm water and urban runoff (during dry and wet weather) are often polluted with pesticides, fertilizers, animal droppings, trash, food wastes, automotive byproducts, and many other toxic substances generated by urban environments. Water that flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas carries these pollutants through the storm drain systems directly into receiving waters.

The Natural Resources Defense Council (NRDC) 1999 report, *Stormwater Strategies, Community Responses to Runoff Pollution*¹ identifies two main causes of the storm water pollution problem in urban areas. Both causes are directly related to development in urban and urbanizing areas:

1. Increased volume and velocity of surface runoff. There are three types of human-made impervious covers that increase the volume and velocity of runoff: (i) rooftop, (ii) transportation imperviousness, and (iii) non-porous (impervious) surfaces. As these impervious surfaces increase, infiltration will decrease, forcing more water to run off the surface, picking up speed and pollutants.
2. High concentration of pollutants in the runoff. Certain activities, such as those from industrial sites, are large contributors of pollutant concentrations to the storm water system.

The report also identified several activities causing storm water pollution from urban areas, practices of homeowners, businesses, and government agencies.

Studies conducted by the United States Geological Survey (USGS)² confirm the link between urbanization and water quality impairments in urban watersheds due to contaminated storm water runoff. Furthermore, the water quality impacts of urbanization and urban storm water discharges have been

¹ *Clean Water & Oceans: Water Pollution: In Depth Report Stormwater Strategies, Community Responses to Runoff Pollution*. Natural Resources Defense Council (NRDC), 1999.

² *Water Quality in the Puget Sound Basin, Washington and British Columbia, 1996-98*, Circular 1216 - USGS 2000; *Water Quality in the Long Island-New Jersey Coastal Drainages, New Jersey and New York, 1996-98*, Circular 1201 - USGS 2000

summarized by several other U.S. EPA reports.³ Urbanization causes changes in hydrology and increases pollutant loads, which adversely impact water quality and impairs the beneficial uses of receiving waters.

Increases in population density and imperviousness result in changes to stream hydrology including:

1. Increased peak discharges compared to predevelopment levels;
2. Increased volume of storm water runoff with each storm compared to pre-development levels;
3. Decreased travel time to reach receiving water; increased frequency and severity of floods;
4. Reduced stream flow during prolonged periods of dry weather due to reduced levels of infiltration;
5. Increased runoff velocity during storms due to a combination of effects of higher discharge peaks, rapid time of concentration, and smoother hydraulic surfaces from channelization; and
6. Decreased infiltration and groundwater recharge.

In order to reduce pollutants and runoff flows from new development and redevelopment to the MEP, each Permittee is required to ensure that all feasible BMPs are considered. The MEP standard involves applying BMPs that are effective in reducing the discharge of pollutants in storm water runoff. In discussing the MEP standard, the State Water Board has said the following: "There must be a serious attempt to comply, and practical solutions may not be lightly rejected. If, from the list of BMPs, a permittee chooses only a few of the least expensive methods, it is likely that MEP has not been met. On the other hand, if a permittee employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit to be derived, it would have met the standard. MEP requires permittees to choose effective BMPs, and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive." (Order No. WQ 2000-11, at p.20.) MEP is the result of the cumulative effect of implementing, continuously evaluating, and making corresponding changes to a variety of technically and economically feasible BMPs that ensures the most appropriate controls are implemented in the

³ *Storm Water Phase II Report to Congress* (U.S. EPA 1995); *Report to Congress on the Phase II Storm Water Regulations* (U.S. EPA1999); *Coastal Zone Management Measures Guidance* (U.S. EPA 1992)

most effective manner. This process of implementing, evaluating, revising, or adding new BMPs is commonly referred to as the iterative approach. For Small MS4s, EPA has stated that pollutant reductions to the MEP will be realized by implementing BMPs through the six minimum measures described in the permit. (64 Federal Register 68753.)

B. Benefits of Permit Program Implementation

Implementation of Best Management Practices (BMPs) will reduce pollutant discharges and improve surface water quality to the maximum extent practicable (MEP). The expected benefits of implementing the provisions of the Sacramento MS4 National Pollutant Discharge Elimination System (NPDES) permit include:

1. **Enhanced Aesthetic Value:** Storm water affects the appearance and quality of a water body, and the desirability of working, living, traveling, or owning property near that water body. Reducing storm water pollution will increase benefits as these water bodies recover and become more desirable.
2. **Enhanced Opportunities for Boating:** reducing sediment and other pollutants, and increasing water clarity, which enhances the boating experience for users, offer additional benefits.
3. **Enhanced Commercial Fishing:** Important because commercial fisheries are a significant part of the nation's economy, and 28% of the estuaries in the 305(b) Report were impacted by storm water/urban runoff.
4. **Enhanced Recreational and Subsistence Fishing:** Pollutants in storm water can eliminate or decrease the numbers, or size, of sport fish and shell fish in receiving waters.
5. **Reduced Flood Damage:** Storm water runoff controls may mitigate flood damage by addressing problems due to the diversion of runoff, insufficient storage capacity, and reduced channel capacity from sedimentation.
6. **Reduced Illness from Consuming Contaminated Fish:** Storm water controls may reduce the presence of pathogens in fish caught by recreational anglers.
7. **Reduced Illness from Swimming in Contaminated Water:** Epidemiological studies indicate that swimmers in water contaminated

by storm water runoff are more likely to experience illness than those who swim farther away from a storm water outfall.

8. **Enhanced Opportunities for Non-contact Recreation:** Storm water controls reduce turbidity, odors, floating trash, and other pollutants, which then allow waters to be used as focal point for recreation, and enhance the experience of the users.
9. **Drinking Water Benefits:** Pollutants from storm water runoff, such as solids, toxic pollutants, and bacteria may pose additional costs for treatment, or render the water unusable for drinking.
10. **Water Storage Benefits:** Storm water is a major source of impairment for reservoirs. The heavy load of solids deposited by storm water runoff can lead to rapid sedimentation of reservoirs and the loss of needed water storage capacity.⁴
11. **Improved Habitat Benefits:** Storm water can have significant impacts to habitat and aquatic life. Stormwater controls can minimize impacts to creek corridors and the wildlife dependent on them.

III. **STATUTORY AND REGULATORY HISTORY AND OTHER CONSIDERATIONS OF THE STORM WATER PROGRAM**

A. **Basis for Permit Conditions**

In the 15 years following the introduction of the Clean Water Act in 1972, water pollution control efforts focused primarily on wastewater discharges from facilities such as factories and sewage treatment plants, with less emphasis on diffuse sources. The federal Clean Water Act (CWA) prohibits the discharge of any pollutant to waters from a point source, unless a NPDES permit authorizes the discharge. Because the focus on reducing pollutants was centered on industrial and sewage treatment discharges, the U.S. Congress amended the CWA in 1987, requiring the U.S. EPA to create phased NPDES requirements for storm water discharges.

In response to the 1987 Amendments to the CWA, the U.S. EPA developed Phase I of the NPDES Storm Water Program in 1990. Phase I required NPDES permits for storm water discharges from: (i) "medium" and "large" MS4s generally serving, or located in incorporated places or counties with, populations of 100,000 or more people; and (ii) eleven categories of industrial

⁴*Report to Congress on Phase II Storm Water Regulations.* U.S. EPA, Office of Water. EPA-833-R-99-001, Oct. 1999.

activity (including construction activity that disturbs five acres or greater of land).

Phase II, adopted in December 2000 and implemented in March 2003, required operators of small MS4s and small construction sites (construction activity disturbing greater than or equal to 1 acre of land or less than 1 acre if part of a larger common plan of development or sale) in urban areas to control storm water runoff discharges.

B. Statutory Basis for Permit Conditions

The intent of the permit conditions is to meet the statutory mandate of the CWA. The conditions established by this permit are based on Section 402(p)(3)(B) of the CWA which mandates that a permit for discharges from MS4s must: (1) effectively prohibit the discharges of non-storm water to the MS4; and (2) require controls to reduce pollutants in discharges from MS4 to the maximum extent practicable (MEP) including best management practices, control techniques, system design and engineering methods, and such other provisions determined to be appropriate. Compliance with water quality standards is to be achieved over time, through an iterative approach requiring improved BMPs.

The permit requires the implementation of a comprehensive SQIP through a selection of BMPs [see 40 Code of Federal Regulations (CFR) 122.44(k)] as the mechanism to achieving the reduction of pollutants in storm water to the maximum extent practicable (MEP) [see CWA. § 402(p)(3)(B)(iii)].

C. Regulatory Basis for Permit Conditions

As a result of the statutory requirements of the CWA, the U.S. EPA promulgated the MS4 Permit application regulations set forth in 40 CFR 122.26(d). These federal regulations described in detail the permit application requirements for MS4s operators. The information in the Report of Waste Discharge⁵ was utilized to develop the permit conditions and determine the Permittees' status in relationship to these conditions.

D. Discharge Limitations

Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of

⁵ County of Sacramento and the Cities of Sacramento, Citrus Heights, Elk Grove, Folsom, Galt, and Rancho Cordova, *Report of Waste Discharge*, June 2007.

the application, in studies, and as directed by monitoring and reporting programs, the Regional Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for several constituents including pesticide and metals, toxicity, pH, temperature, dissolved oxygen, pathogen and chlorine from illicit discharges.

No numeric effluent limitations are proposed at this time. In accordance with 40 CFR 122.44(k), the U.S. EPA has required a series of increasingly more effective BMPs⁶, in the form of a comprehensive SQIP and performance standards, in lieu of numeric limitations.⁷

The State Water Resources Control Board (SWRCB) convened a Storm Water Panel (Blue Ribbon Panel) of experts to address the issue of numeric effluent limits.⁸ The study, finalized in June 2006, also concluded that it is not feasible at this time to set enforceable numeric effluent limits for storm water and non-storm water discharges from MS4s.

E. Permitting Approach

The 1987 amendments to the Clean Water Act required municipalities to apply for MS4 permits that would reduce the pollutants in discharges to the maximum extent practicable. EPA Phase I Final Rule and Regulations then established the regulations for NPDES permit application requirements. EPA discussed how the language of CWA section 402(p)(3) contemplated fundamentally different characteristics of many municipalities and that municipalities would have permits tailored to meet particular geographical, hydrological, and climatic conditions. EPA continued to discuss that if MS4 permit conditions required storm water management programs (SWMP) to be developed and implemented, the program elements were enforceable in accordance with the terms of permit. EPA further pointed out that the permit goal for MS4 discharges is to avoid inflexibility in the types and levels of control. EPA stated that if mandatory requirements were appropriate, these requirements should be established under the authority of 40 CFR Section 402(p)(6), which addresses permit application requirements.

The SQIP is required as part of the Report of Waste Discharge pursuant to 40 CFR 122.26(2)(d)(iv); therefore is an integral and enforceable component

⁶ *Interpretative Policy Memorandum on Reapplication Requirements* of MS4s issued by U.S. EPA (61 Fed. Reg. 41697), August 9, 1996

⁷ *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits* (61 Fed. Reg. 43761), September 1, 1996

⁸ Recommendations of the Blue Ribbon Panel were finalized as *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*, dated 19 June 2006.

of the MS4 permit. In addition, the California Superior Court ruled, *“Because the Storm water Management Plan is incorporated and is deemed an integral part of the Permits...any changes to the Plan are actually changes to the Permits. Because these are changes to the Permits, the notice and comment requirements must be complied with.”* (San Francisco Baykeeper vs. Regional Water Quality Control Board, San Francisco Bay Region, Consolidated Case No. 500527, California Superior Court, 14 November 2003).

F. Policy

The State Water Resources Control Board adopted Resolution 68-16 (“Statement of Policy with Respect to Maintaining High Quality of Waters in California”) (Antidegradation Policy), which requires the Regional Water Board to assure maintenance of the high quality of waters of the State unless the Regional Water Board makes certain findings. Under this policy, water quality degradation may be allowed if the following conditions are met: 1) any change in water quality must be consistent with maximum benefit to the people of the State; 2) will not unreasonably affect present and anticipated beneficial uses; 3) will not result in water quality less than prescribed in the Basin Plan; and 4) the discharge is required to meet waste discharge requirements that result in the best practicable treatment or control necessary to assure that pollution or nuisance will not occur and the highest water quality consistent with maximum benefit to the people of the state will be maintained. The communities covered by this Permit have continued to develop since adoption of the previous permit. The increase in volume and mass of pollutants from the new urban runoff will not have significant impacts on aquatic life, municipal and domestic supply, and recreation uses, which are the beneficial uses most likely affected by the pollutants discharged.

An antidegradation analysis was submitted in September 2007.⁹ The water quality impacts presented in the analysis shows that storm water runoff emanating from new urban development projected to occur in the Sacramento Urbanized Area during the next five years will generally produce minor changes in loadings and concentrations of the ten pollutants evaluated. The pollutants evaluated include: diazinon, dissolved copper, *E. coli*, biological oxygen demand (BOD), total dissolved solids (TDS), total mercury, total nitrogen, total organic carbon (TOC), chrysene and total suspended solids (TSS). Constituents selected for evaluation include those identified by the Permittees as Target Pollutants in the Report of Waste Discharge,¹⁰ constituents for which the Regional Water Board is developing TMDLs, and/or

⁹ Sacramento Stormwater Quality Partnership, *Antidegradation Analysis – Storm Water Management Program*, September 2007, Larry Walker and Associates.

¹⁰ County of Sacramento and the Cities of Sacramento, Citrus Heights, Elk Grove, Folsom, Galt, and Rancho Cordova, *Report of Waste Discharge*, June 2007.

constituents considered particularly relevant to the water quality of the Sacramento-San Joaquin Delta.

Section 5.0 of the Antidegradation Analysis¹¹ provides an assessment of the Storm Water Management Program. The program elements include new development standards that were developed and implemented during the last permit term. This Permit requires the revision of the development standards and associated technical design guidance (a.k.a. *Stormwater Quality Design Manual*,¹² requiring new development and significant redevelopment priority projects to incorporate appropriate source control measures, runoff reduction control measures, and/or treatment control measures. Site design and site-specific source controls are generally the most effective means to control urban runoff pollution because they keep pollutants from contacting runoff and minimize the need for treatment. Runoff reduction measures disconnect impervious surfaces from the storm drain system and promote infiltration when site conditions allow; such measures can reduce the treatment volume or flow required. Treatment controls are intended to remove pollutants from site runoff before reaching the storm drain system or receiving water.

The Water Quality Impacts Assessment Methodology, found in Section 6.3 of the antidegradation analysis, includes a rainfall-runoff mass balance model. Land use projections and the best available agricultural runoff data were used to estimate the change in loadings from 2007 and 2012 urbanized areas. These load changes were then used along with available receiving water data to assess changes in receiving water concentrations and compliance with known water quality objectives. The model shows that the estimated pollutant loading attributable to new urban development show both increases and decreases depending on the constituent. The constituent-by-constituent evaluation of modeled impacts due to new urban development is presented in Section 6.3.5. The analysis reports that the estimated pollutant reductions for existing and new urban development range from 5% to 10%, with the exception of reductions assumed for diazinon. Diazinon has been phased out of urban use and its use in agriculture has greatly decreased, but a conservative estimate of 75% rather than 100% pollutant reduction was chosen to account for stockpiling and continued allowable use of products containing the pesticide. The percent reductions shown in Table 6-7¹³ reflect a very conservative estimate for pollutant reduction due to implementation of Stormwater Quality Improvement Plan best management practices. Additionally, implementation of best management practices (primarily, extended detention basins) for new urban development, along with elements of low impact development, such as onsite infiltration, and hydromodification

¹¹ *Antidegradation Analysis*, pages 5-1 to 5-11.

¹² Sacramento Stormwater Quality Partnership and City of Roseville, *Stormwater Quality Design Manual for the Sacramento and South Placer Regions*, May 2007.

¹³ *Antidegradation Analysis*, pages 6-8.

concepts, are expected to further reduce pollutant concentrations and flows attributable to new urban development runoff. Specific elements of the Permittee's Stormwater Quality Improvement Plan are discussed in Section 5, and outlined in Appendix A of the analysis.

Based on the antidegradation analysis: 1) some degradation for a limited number of constituents is consistent with the maximum benefit to the people of the state; 2) the activity is necessary to accommodate important economic or social development in the area; 3) resulting water quality is adequate to fully protect and maintain existing beneficial uses; and 4) the discharge will not cause measurable changes in the receiving waters that cause the receiving waters to fall below applicable water quality objectives.

The analysis included an examination of: 1) existing applicable water quality standards; 2) ambient conditions in receiving waters compared to standards; 3) incremental changes in constituent loading, both concentration and mass; 4) treatability and levels of treatment or controls to be used and whether increased treatment is proposed to offset any increased volume or mass of discharge; 5) reduction of the discharge of pollutants from the urban areas to the maximum extent practicable (MEP); 6) comparison of the proposed increased volume or mass of pollutants relative to the volume or mass of pollutants that existed when the current permit was adopted; 7) an assessment of the significance of changes in ambient water quality compared to historic conditions, and 8) an analysis of alternatives to the discharge and treatment or control methods that would reduce water quality impacts.

The discharge from continued urban development will result in some minimal degradation of waters of the state and navigable waters of the United States, but in this case, such degradation is consistent with the maximum benefit to the people of the state. Limited degradation that does not cause exceedance of water quality objectives is warranted to allow for the economic benefit stemming from local growth. There is also a need in the Sacramento area to accommodate growth. The Regional Water Board does not have the jurisdiction to control growth in the County of Sacramento and associated Cities, but is required to assure that the receiving waters are adequately protected as a result of urban discharges. The proposed Permit allows storm water utility service necessary to accommodate housing and economic expansion in the area, and is considered to be a benefit to the people of the State. Compliance with these requirements will result in the reduction of discharge pollutants from the urban areas to the MEP.

The Regional Water Board is required to protect beneficial uses of receiving waters that involve freshwater aquatic life (e.g., WARM, COLD, SPWN, MIGR). The Basin Plan's toxicity narrative objective, reflected in Receiving Water Limitation C.1 of the Order states in L: "Toxic pollutants to be present

in the water column, sediments, or biota in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.” This receiving water limitation is designed to provide protection of the beneficial uses of the receiving water. Therefore, the numeric receiving water limit for chlorine has been removed from the order since the objective is covered by the narrative toxicity objective.

IV. BACKGROUND – SACRAMENTO AREAWIDE NPDES MS4 PERMIT PROGRAM

A. Sacramento Areawide NPDES MS4 Permit History

In June 1990, the Regional Board issued the first NPDES permit for the Sacramento area-wide MS4 program (Program). The permit was issued to Permittees from the County of Sacramento and the cities of Sacramento, Folsom and Galt. The County of Sacramento and the City of Sacramento have populations greater than 250,000 and are considered large municipalities in accordance with Appendices H and F, respectively, of Part 122 of Title 40 of the Federal Code of Regulations (40 CFR 122). The Cities of Folsom and Galt are urbanized areas with populations of less than 100,000 and would ordinarily not be covered under the Phase I program. However, because of their proximity to the urbanized areas of the County and the location of their storm sewer system discharges relative to discharges from the County’s system, these cities were designated in 1990 as part of the large MS4 (40 CFR 122.26(b)(7)(iii)).

In 1996, the Regional Board renewed the Sacramento area-wide MS4 permit for a second five-year term. On 3 November 2000, the Permittees (now including the newly incorporated Cities of Citrus Heights and Elk Grove within the Sacramento Urbanized Area) submitted Reports of Waste Discharge to the Regional Water Board to request renewal of their MS4 permit.

In December 2002, the Regional Water Board adopted the third Sacramento area-wide MS4 permit. The City of Rancho Cordova incorporated in 2003 and was therefore added to the Permit by the Regional Water Board in 2004.

The Permittees’ SQIPs^{14,15} submitted with the Report of Waste Discharge in June 2007 describe the 18-year history and evolution of the Sacramento program, including a summary of accomplishments and findings.

¹⁴ County of Sacramento and the Cities of Citrus Heights, Elk Grove, Folsom, Galt, and Rancho Cordova, *Storm Water Quality Improvement Plan (SQIP)*, Draft June 2007.

¹⁵ City of Sacramento, *Stormwater Quality Improvement Plan (SQIP)*, Draft June 2007.

B. Storm Drain System

The Permittees have jurisdiction over and/or maintenance responsibility for their respective MS4s that they own and operate in Sacramento County. The storm water discharges consist of storm water generated from various land uses in all the hydrologic sub-basins, which discharge into urban creeks and in turn flow into the primary rivers of Sacramento County. All discharges from the Sacramento Urbanized Area ultimately make their way to the Sacramento River. The tributary rivers which receive storm water from one or more Permittees include the American, Cosumnes and Mokelumne Rivers. The quality and quantity of these storm water discharges varies considerably, owing to the effects of land use, season, geology, and sequence and duration of hydrologic events.

C. Total Maximum Daily Loads (TMDLs)

Total Maximum Daily Loads (TMDLs) are one of the Regional Board's highest priorities. The Regional Water Board considers storm water discharges from the Sacramento Urbanized Area to be significant sources of pollutants. The proposed Permit includes a list of 303(d) listed waterbodies, some of which have TMDLs that are in various stages of completion. NPDES permits must be consistent with approved TMDL waste load allocations. To implement adopted TMDLs, this proposed Permit implements control programs developed to attain waste load allocations.

The Permittees submitted to the Regional Water Board a Pesticide Plan (in 2004) to fulfill the need for a pesticide toxicity control plan as required by the urban creeks pesticide TMDL. The Pesticide Plan was subsequently approved by the Regional Water Board. The plan addresses their own use of pesticides including diazinon, chlorpyrifos, and other lower priority pesticides and use of such pesticides by other sources within their jurisdiction. This proposed Order fulfills a component of the TMDL Implementation Plan adopted by this Regional Water Board on 23 June 2006 for diazinon and chlorpyrifos for the Sacramento-San Joaquin Delta Waterways and by requiring a management plan which includes BMPs, BMP implementation plan, effectiveness assessment, and compliance schedule that describes actions that will be taken to reduce diazinon and chlorpyrifos discharges and meet the applicable allocations. This proposed Order includes Provisions consistent with the TMDL waste load allocations and the Basin Plan implementation program. This proposed Order specifies monitoring and assessment requirements to implement these Provisions. The establishment of Water Quality Based Effluent Limits expressed as iterative BMPs to achieve the Waste Load Allocation (WLA) compliance schedule is appropriate and is expected to be sufficient to achieve the WLA specified in the TMDL.

The Regional Water Board Toxic Hot Spots Clean-up Plan (California Water Code section 13394) identified the following hot spots that are applicable to this discharge:

- a. Mercury in the Delta; and
- b. Diazinon and Chlorpyrifos in Morrison Creek in the City of Sacramento

The California Water Code section 13395 requires the reevaluation of waste discharge requirements for dischargers who have discharged pollutants causing all or part of the toxic hot spot. The waste discharge requirements must be revised to include requirements that "prevent the maintenance or further pollution of existing toxic hot spots." Further "(t)he Regional Water Board may determine it is not necessary to revise a waste discharge requirement only if it finds that the toxic hot spot resulted from practices no longer being conducted by the discharger... or that the discharger's contribution to the creation or maintenance of the toxic hot spot is not significant." Requirements to prevent the creation of new or maintenance of existing toxic hot spots are included with the provisions to address the 303(d) listings for these waterbodies.

The Delta, Sacramento River, American River, and Lake Natoma are on the Clean Water Act Section 303(d) List as mercury impaired because of elevated levels of methylmercury in fish. In addition, the State Board has designated the Delta as a toxic hot spot under the Bay Protection and Toxic Hot Spot Cleanup Program.

To address mercury impairment of the Delta, Sacramento and American Rivers, and Lake Natoma, this Permit requires the Permittees to:

- Continue to implement the Mercury Plan.
- Coordinate the Permittees' mercury control programs with the above-mentioned countywide U-waste management strategy.
- Evaluate the total mercury and methylmercury data collected under the previous Permit and continue urban discharge monitoring to determine the extent to which urban lands within the Sacramento area contribute methylmercury and total mercury to the individual impaired water bodies (Delta, Sacramento River, American River, and Lake Natoma).
- Estimate the amount of total mercury and sediment prevented from discharging to receiving waters by existing BMPs in the Sacramento Urbanized Area such as, but not limited to, street cleaning, detention basins, and erosion and sediment controls.

- Consider including total mercury and methylmercury monitoring in the design of future BMP studies to estimate the extent to which existing and new BMPs reduce total mercury and reduce and/or increase methylmercury discharges.

The Monitoring and Reporting Program portion of this proposed Order specifies monitoring and assessment requirements that must be implemented to gather information for future mercury control programs. Once the Delta mercury control program is approved, there may be additional monitoring requirements to identify the sources of the methylmercury and total mercury in urban runoff to the Delta, lower American River, and the other mercury-impaired water bodies.

Finding No. 87 of the proposed Order states: "CWA Section 303(d) and 40 CFR 130.7 require states to identify water quality-impaired water bodies and pollutants of concern, and develop Total Maximum Daily Loads (TMDLs). A TMDL is a quantitative assessment of the total pollutant load that can be discharged from all sources each day while still meeting water quality objectives. The Regional Water Board is currently in the process of developing TMDLs for listed water bodies within the Region. Prior to TMDL's being adopted and approved, Permittees must implement actions to address their contribution to the water quality impairments. Once the Regional Water Board and U.S. EPA approve TMDLs, this Order may be amended to incorporate provisions consistent with waste load allocations established under the TMDLs."

Provision D.3.d. of the proposed Order requires the Permittees revise their SQIP to comply with regional or watershed-specific requirements, and/or waste load allocations developed and approved pursuant to the process for the designation and implementation of TMDLs for impaired water bodies.

V. **STORM WATER MANAGEMENT PROGRAM ELEMENTS**

Federal regulations (40 CFR 122.26(d)(2)(iv)) provide that, "A proposed management program covers the duration of the permit. It shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program."

As part of the June 2007 Report of Waste Discharge, the County of Sacramento in association with the cities of Citrus Heights, Elk Grove, Folsom, Galt and Rancho Cordova submitted a SQIP, and the City of Sacramento submitted a separate

SQIP. These SQIPs describe the framework for management of storm water discharges during the term of this permit. The draft SQIPs provide the goals and objectives, legal authorities, source identification process, funding sources, best management practices (BMPs) evaluation and improvement process, approach for effectiveness assessments of the programs, and a monitoring plan. The draft SQIPs also include specificity for each program element and control measures that identifies what actions are to be taken, the timeframe for the actions, the responsible parties and the data that needs to be collected in order to identify if the program is effective. The overall goals of the Permittees' SQIPs are to a) reduce the degradation of waters of the State and Waters of the United States (U.S.) by urban runoff and protect their beneficial uses, and b) develop and implement an effective SQIP that is well understood and broadly supported by regional stakeholders. The SQIPs are an integral and enforceable component of the proposed Permit.

The SQIPs include the following major program components:

- i. Program Management
- ii. Construction Element
- iii. Commercial/Industrial Element
- iv. Municipal Operations Element
- v. Illicit Discharge Element
- vi. Public Outreach Element (including watershed stewardship)
- vii. Planning and New Development Element
- viii. Monitoring Program
- ix. Water Quality Based Program (Target Pollutant Program)
- x. Watershed Stewardship
- xi. Training
- xii. Program Effectiveness Assessment

Some of the components and the corresponding Order requirements are discussed below.

A. Program Management

Program management includes planning, fiscal analysis, legal authority, staffing, inter and intra-agency coordination, and internal and external (i.e., compliance) reporting.

The Permit requires that each Permittee agency demonstrates that they have adequate funding to comply with the requirements of this Permit. Most agencies have established stormwater utilities, which are fees assessed on a property to the property owner based on an estimate of storm water runoff generated for the site, to fund these activities. The City of Folsom is the only Permittee agency that receives their program funding from the General Fund.

Financing the increasing requirements of the MS4 program offers a considerable challenge for municipalities. Proposition 218 significantly limits a municipality's ability to increase funding by requiring storm water utility fees and fee increases to go before the voters for approval¹⁶. There has been limited success in California in recent years in achieving approval of new stormwater utility fees.

The Permit requires each agency to have the legal authority necessary to implement their program. Each Permittee agency has an adopted stormwater ordinance in place, which defines allowable discharges within the municipality and provides the necessary authority to conduct enforcement against those who discharge illegally. In addition, each municipality has the legal authority to require the use and maintenance of construction BMP's through their grading ordinances.

The Permit also requires that the Permittees demonstrate that they have the necessary agreements in place to coordinate joint program activities. The Permittees have executed a memorandum of understanding (MOU) which defined a partnership and each agency's role in the joint program. This Permit requires that the Permittees update the MOU.

For compliance reporting, the Permit requires submission of an Annual Work Plan by 1 May of each year. The Annual Work Plan describes the Permittees' proposed activities for the upcoming year beginning 1 July of the current year and ending 30 June the following year. The Permit also requires submission of an Annual Report by 1 October of each year. The Annual Report documents the status of the Permittees' activities conducted during the previous fiscal year in conformance with the approved SQIPs, including the results of the Program Effectiveness Assessment. The Annual Report includes a compilation of deliverables and milestones completed during the previous 12-month period, as described in the SQIP and Annual Work Plan.

B. Construction Program Element

Legal Authority and Discussion

Federal regulations [40 CFR 122.26(d)(2)(iv)(D)] provide that a proposed management program must include *"a description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system."*

¹⁶ Cal. Const. Art. XIID, 6.c; *Howard Jarvis Taxpayers Association v. City of Salinas* (2002) 98. Cal.App. 4th 1351.

Status of the Sacramento Program

Since the initiation of the program in 1990, the Permittees have completed the following work:

- Established the legal authority to prohibit non-stormwater discharges and enforce those prohibitions through the adoption of local land grading and erosion control and stormwater ordinances
- Established and continued implementation of inspections, reporting procedures and enforcement to achieve compliance on construction sites.
- Conducted employee training with regard to review, inspection and enforcement
- Provided outreach and guidance to the development community through workshops and brochures on local and State requirements
- Established and maintained tracking databases and maps to assist with investigations and identification of problem areas

Discussion of the Requirements in This Permit

This Permit requires the continuation of the Permittees' review, inspection, and enforcement activities, and further requires the performance of an assessment to determine the effectiveness of these activities and identify any necessary modifications for continuous improvement.

C. Commercial/Industrial Program Element

Legal Authority and Discussion

Federal regulations [40 CFR 122.26(d)(2)(iv)(C)] require the following, "A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system.

The program shall:

1. *Identify priorities and procedures for inspections and establishing and implementing control measures for such discharges;*

2. *Describe a monitoring program for storm water discharges associated with industrial facilities...* "

The municipality is ultimately responsible for discharges from the MS4. Because industrial awareness of the program may not be complete, there may be facilities within the MS4 area that should be permitted but are not (non-filers). The Phase I regulations requiring industries to obtain permit coverage for storm water discharges is largely based on the Standard Industrial Classification Code. This has been shown to be incomplete in identifying industries (which include commercial businesses) that may be significant sources of storm water pollution. In addition, the permitting authority may not have adequate resources to provide the necessary oversight of permitted facilities. Therefore, it is in the municipality's best interest to assess the specific situation and implement an industrial/commercial inspection and enforcement program to control the contribution of pollutants to the MS4 from all these potential sources.

In the preamble to the 1990 regulations, the U.S. EPA clearly states the intended strategy for discharges of storm water associated with industrial activity:

"Municipal operators of large and medium municipal separate storm sewer systems are responsible for obtaining system-wide or area permits for their system's discharges. These permits are expected to require that controls be placed on storm water discharges associated with industrial activity which discharge through the municipal system."

The U.S. EPA also notes in the preamble that *"municipalities will be required to meet the terms of their permits related to industrial dischargers."*

Similarly, in the U.S. EPA's Guidance Manual¹⁰ (Chapter 3.0), it is specified that MS4 applicants must demonstrate that they possess adequate legal authority to:

- Control construction site and other industrial discharges to MS4s;
- Prohibit illicit discharges and control spills and dumping;
- Carry out inspection, surveillance, and monitoring procedures.¹⁷

The document goes on to explain that *"control"*, in this context means not only to require disclosure of information, but also to *limit, discourage, or terminate* a storm water discharge to the MS4. Further, to satisfy its permit conditions, a municipality may need to impose additional requirements on discharges from

¹⁷ *Guidance Manual For the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems* - U.S. EPA -November 1992

permitted industrial facilities, as well as discharges from industrial facilities and construction sites *not* required to obtain permits.

In the same Guidance Manual¹⁸ (Chapter 6.3.3), it is stated that the municipality is ultimately responsible for discharges from their MS4. Consequently, the MS4 applicant must describe how the municipality will help the U.S. EPA and authorized NPDES States to:

- Identify priority industries discharging to their systems;
- Review and evaluate storm water pollution prevention plans (SWPPPs) and other procedures that industrial facilities must develop under general or individual permits;
- Establish and implement BMPs to reduce pollutants from these industrial facilities (or require industry to implement them); and
- Inspect and monitor industrial facilities discharging storm water to the municipal systems to ensure these facilities are in compliance with their NPDES storm water permit, if required.
- Recognizing that the Permittees are ultimately responsible for the quality of storm water discharges from the MS4, the Permittees must effectively regulate industrial/commercial facilities and activities to maintain compliance with their stormwater ordinances by continuing implementation of their current programs and enhancing them, as needed, based on effectiveness assessments.

It may be necessary to update existing ordinances if they do not provide sufficient legal authority to implement the above components as required by the regulations.

Status of the Sacramento Program

Since 1990, the Permittees have completed the following work as part of the Industrial/Commercial Program:

- Developed and revised Stormwater Ordinances to prohibit non-stormwater discharges to the MS4, prevent prohibited conditions, require appropriate BMPs for pollutant generating activities, and authorize a structured inspection program for industrial and commercial facilities
- Significant industries were identified based upon their potential to discharge pollutants to the MS4. Mobile categories are subject to focused outreach efforts while stationary facilities are included in a program of regular compliance inspections
- Established agreement with Sacramento County Environmental Management Department (EMD) to conduct routine inspections of

¹⁸ *Id.*

targeted industries on behalf of MS4 Permittees. EMD was provided authority to enforce local stormwater ordinances within 7 jurisdictions in Sacramento County and to recover costs from the regulated community to fund the program.

- Launched the Clean Water Business Partner program, an incentive program to encourage businesses to protect stormwater quality

Discussion of Requirements in This Permit

This Permit requires the continuation of the Permittees' inspection, response and enforcement activities at priority commercial/industrial facilities and coordination with the Regional Water Board at facilities covered under the Industrial General Permit. The Permit also requires the performance of an assessment to determine the effectiveness of these activities and identify any necessary modifications for continuous improvement.

Recognizing the dual coverage envisioned by the federal regulations¹⁹, and suggested partnership between local and State authorities, this Permit requires Permittees to coordinate with State activities for the implementation of the General Industrial Activities Storm Water Permit (General Industrial Permit). The goal is to control industrial sources and other sources not specifically covered under Phase I storm water regulations but identified as significant contributors of pollutants by the municipalities through their identification and prioritization studies. The net result should be a better and improved coordinated program with greater impact on limiting and eliminating (as a final goal) the contribution of pollutants to the receiving water while maintaining and/or restoring the capacity of the receiving water to sustain the beneficial uses without impairments.

Based on the dual coverage and partnership approach between the permitting authority and municipalities that the U.S. EPA envisioned in the storm water regulations^{20,21}, and in order to best use limited resources at the State and local levels, the Permit includes improvements requiring the Permittees to: (i) Control the storm water discharges associated with industrial activities and other commercial facilities identified as significant contributors of pollutants; and (ii) Assist the Regional Board in implementing the general permit for industrial activities.

¹⁹ Federal Register Vol. 55, No 222, pp. 48000; U.S. EPA Storm Water Phase II Compliance Assistance Guide, 2000, pp. 4-32 and 5-11, where it clarifies the dual responsibility

²⁰ Letter dated December 19, 2000, from Alexis Strauss, Director, Water Division, U.S. EPA Region IX, to Dennis Dickerson, Executive Officer, Regional Water Quality Control Board-Los Angeles Region.

²¹ Letter dated April 30, 2001, from Alexis Strauss, Director, Water Division, U.S. EPA Region IX, to Honorable Stephen Horn, U.S. House of Representatives

This approach is consistent with the nationwide approach used by the U.S. EPA in issuing *second term* MS4 permits²². Also, this approach is consistent with other MS4 permits issued in California: San Diego, Santa Clara, and Los Angeles permits. The education and outreach should be continued under the auspices of the Public Education program.

D. Municipal Operations Program Element

Legal Authority and Discussion

Federal regulations [40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6)] require that each Permittee must develop a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable for all urban land uses and activities, including municipal areas and activities.

Permittees regularly provide services to communities that result in the enhancement of the lives of the residents. Some of these services include: sewage system operations; drinking water distribution; flood control and prevention activities; public construction activities; road maintenance; landscaping; recreational facility management; and parking facility management. Other activities are required to support these community services, such as fleet maintenance and operation of corporation yards and material storage facilities.

Each Permittee is required to update and continue to implement a Municipal Operations Program Element in its SQIP to effectively prohibit non-storm water discharges and prevent or reduce pollutants in runoff from all municipal land use areas, facilities, and activities to the MEP.

Status of the Sacramento Stormwater Program

Since 1990, the Permittees have completed the following work as part of the Municipal Operations Element:

- Complied with the State General Construction Permit for applicable municipal construction projects;
- Conducted audits of existing municipal facilities having the potential to discharge pollutants into urban runoff, and developed applicable mitigation procedures and/or best management practices (BMPs) to reduce pollutant discharges to the MEP at these sites;
- Conducted prioritized storm drain/facility maintenance activities based upon accumulation of debris, customer complaints, and seasonal

²² MS4 NPDES Permits issued to Palm Beach County, Broward County, Sarasota County, Florida, Tulsa, Oklahoma, Denver, Colorado.

- concerns;
- Implemented cleaning and maintenance programs for prioritized streets and parking lots;
- Ensured that most (for some Permittees, all) storm drain inlets were marked with the “No Dumping-Drains to Creek/River” message with either durable curb markers, stenciling, or permanent concrete stamps; and
- Trained affected staff at least annually on the impacts of stormwater pollution, associated prevention activities, and illicit connection and discharge identification and reporting procedures.

Discussion of the Requirements in This Permit

This Permit requires the continuation of the Permittees’ efforts from the previous permit term to control stormwater pollution resulting from the operation and maintenance of permittee-owned land use areas, facilities, and activities. The Permit further requires the performance of an assessment to determine the effectiveness of these activities and identify any necessary modifications for continuous improvement.

E. Illicit Discharge Program Element

Legal Authority and Discussion

Federal regulations [40 CFR 122.26(d)(2)(iv)(B)] state that a proposed management program shall include a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer. It states further that a Permittee must include in its proposed management program a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system.

During dry weather, much of the discharge to storm drain systems consists of wastes and wastewater from non-storm water sources that could include illicit discharges or connections, or both. Illicit discharges may occur either through direct connections, such as deliberate or mistaken piping, or through indirect connections, such as dumping, spillage, subsurface infiltration, and washdown.

Each Permittee is required to update and continue to implement an Illicit Discharge Detection and Elimination Program component of the SQIP to actively seek and eliminate illicit discharges and connections to the MEP.

Status of the Sacramento Program

Since the initiation of the program in 1990, the Permittees have completed the following work:

- Established the legal authority to prohibit illegal discharges and enforce those prohibitions through the adoption of local Stormwater Ordinances
- Established and have been implementing illicit discharge response and reporting procedures to investigate, identify and abate illicit discharges
- Conducted employee training with regard to illicit discharges and enforcement
- Continued implementation of solid, recycling and household hazardous waste collection programs
- Conducted illicit discharge field screening activities which resulted in few if any discharges to eliminate.
- Established and maintained tracking databases and maps to assist with investigations and identification of problem areas

Discussion of Requirements in this Permit

This Permit requires the continuation of the Permittees' inspection, response, and enforcement activities, and further requires the performance of an assessment to determine the effectiveness of these activities and identify any necessary modifications for continuous improvement.

F. Public Outreach Public Education Program (Collectively Public Outreach Program)

Legal Authority and Discussion

Federal regulations [40 CFR 122.26(d)(2)(iv)(A)(6)] provide that the proposed management program include, *"A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewer system associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."* These regulations [40 CFR 122.26(d)(2)(iv)(B)(6)] also provide that the proposed management program include, *"A description of education activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."*

To satisfy the Public Outreach Program, the Permittees need to: (i) Implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of storm water discharges on local water bodies and the steps that can be taken to reduce storm water pollution; and (ii) Determine the appropriate BMPs and measurable goals for this minimum control measure.

Status of the Sacramento Program

The Permittees have made significant progress in developing and implementing programs to educate the public about the impacts of stormwater pollution. In addition, the Permittees encourage the public to participate in stewardship activities to enhance and protect the quality of Sacramento's waterways.

The following highlights the major accomplishments of the regional public outreach program since 1990:

- Developed a 24-hour public reporting hotline for stormwater-related issues
- Developed and implemented a regional media campaign, including Cable TV commercials, billboards and other media. Due in large part to this campaign, the permittees far exceeded the 2002-07 stormwater permit term requirements for the number of impressions
- Promoted the Sacramento Stormwater Quality Partnership's website to the general public
- Promoted citizen participation in watershed stewardship (e.g., volunteer storm drain stenciling, creek cleanups)
- Developed and distributed several educational materials for school children, residents, and businesses
- Developed the Clean Water Business Partner program, an incentive program to encourage businesses to protect stormwater quality
- Developed educational materials for the multicultural community
- Supported several educational programs targeting school children
- Participated in various community outreach events
- Coordinated with other agencies/organizations to develop and implement effective outreach
- Conducted public opinion surveys to gauge the level of awareness and behavior changes within the community or target audience

Discussion of Requirements in This Permit

This Permit requires continuation of the Permittees' educational storm water and urban runoff outreach programs. The ongoing program is consistent with

the U.S. EPA recommendations that materials and activities should be relevant to local situations and issues, and incorporate a variety of strategies to ensure maximum coverage.²³ To help address local situations and sources of specific pollutants, the Public Outreach Program requires specific programs for targeted communities. The effective Permittee coordination efforts of the Sacramento program are also consistent with the U.S. EPA's findings which encourage partnerships and cooperation.²⁴ This coordination helps ensure that the Permittees are implementing the most efficient and effective program. It is generally more cost-effective to have numerous operators coordinate to use an existing program than all developing their own local programs. Furthermore, directing materials or outreach programs toward specific groups of commercial, industrial, and institutional entities likely to have significant storm water impacts is recommended.²⁵ In compliance with past Permits, the Permittees have been implementing a business outreach program to educate management and employees at prioritized businesses about storm water regulations.²⁶ Also, the Permittees have been supporting and working with the Business Environmental Resource Center for years. Consistent with the EPA findings, working with this kind of non-regulatory confidential business assistance program encourages small businesses that lack access to the expertise necessary to comply with storm water regulations and to implement pollution prevention measures. The business assistance program is not a requirement; however, its implementation is encouraged.

The Permittees are required to implement a Public Outreach Program using appropriate media to: (1) measurably increase the knowledge of target communities regarding MS4s, impacts of urban runoff on receiving waters, and potential BMP solutions for the target audience; and (2) to change the behavior of target communities and thereby reduce pollutant releases to MS4s and the environment.

Each Permittee is also required to update and continue to implement the Public Outreach Component of its SQIP to educate the public and encourage their participation in the implementation of the SQIP to the MEP. In addition, each Permittee is required to continue to incorporate a mechanism for public participation in the implementation of the SQIP (i.e., programs that engage the public in cleaning up creeks, removal of litter in river embankments, etc.).

G. Water Quality Impaired Water Bodies

Clean Water Act Section 303(d) and 40 CFR 130.7 require states to identify water quality-impaired water bodies and pollutants of concern, and develop

²³ Phase II Fact Sheet 2.3

²⁴ *Id.*

²⁵ Phase II Fact Sheet 2.3

²⁶ Order No. R5-2002-0181

TMDLs. A TMDL is a quantitative assessment of the total pollutant load that can be discharged from all sources each day while still meeting water quality objectives. The Regional Board is currently in the process of developing TMDLs for listed water bodies within the Region. Once the Regional Board and U.S. EPA approve TMDLs, the Permittees' discharge of storm water into an impaired water body will be subject to load allocations and implementation plans established under the TMDLs. Certain assessments by the Permittees to address 303(d) listed water bodies and constituents are warranted and required by this Permit.

H. Planning and New Development Program

Legal Authority and Discussion

Federal regulations (40 CFR 122.26) require that pollutants in storm water be reduced to the MEP. The U.S. EPA's definition is intentionally broad to provide maximum flexibility in MS4 permitting and to give municipalities the opportunity to optimize pollutant reductions on a program-to-program basis.²⁷ The definition of MEP has generally been applied to mean implementation of economically achievable management practices. Because storm water runoff rates can vary from storm to storm, the statistical probabilities of rainfall or runoff events become economically significant and are central to the control of pollutants through cost effective BMPs. Further, it is recommended that storm water BMPs be designed to manage both flows and water quality for best performance.²⁸ It is equally important that treatment BMPs once implemented be routinely maintained.

This Permit requires permittees reduce pollutants and runoff flows from new development and redevelopment to the MEP. The MEP standard involves applying best management practices (BMPs) that are effective in reducing the discharge of pollutants in storm water runoff. If, from a list of BMPs, a permittee chooses only a few of the least expensive methods, it is likely that MEP has not been met. Alternatively, if a permittee employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit to be derived, it would have met the standard. MEP requires permittees choose effective BMPs, and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive. MEP is the result of the cumulative effect of implementing, continuously evaluating, and making corresponding changes to a variety of

²⁷ *Storm Water Phase II Final Rule* – Pre-Federal Register Version, p 87 (U.S. EPA 1999). See U.S. EPA's discussion in response to challenges that the definition is sufficiently vague to be deemed adequate notice for purposes of compliance with the regulation.

²⁸ *Urban Runoff Pollution – Summary Thoughts* – The State of Practice Today and For the 21st Century. Wat. Sci. Tech. 39(2) pp. 353-360. L.A. Roesner (1999)

technically and economically feasible BMPs that ensure the most appropriate controls are implemented in the most effective manner.

The U.S. EPA, based on the NURP, supports the first half-inch of rainfall as generating first flush runoff.²⁹ First flush runoff is associated with the highest pollutant concentrations, and not pollutant load. The U.S. EPA considers the first flush treatment method, the rainfall volume method, and the runoff capture volume method as common approaches for sizing of water quality BMPs.

On 5 October 2000, the State Water Board adopted Order WQ 2000-11³⁰ concerning the use of Standard Urban Storm Water Mitigation Plans (SUSMPs) in municipal storm water permits for new developments and significant redevelopments by the private sector. The precedent setting decision largely sustained the LA Regional Board SUSMPs. The State Board amended the SUSMP to limit its application to discretionary projects as defined by CEQA, eliminated the category for projects in environmentally sensitive areas, and set aside the requirement for retail gasoline outlets to treat storm water until a threshold is developed in the future. In addition, the State Board articulated its support for regional solutions and mitigation banking. The State Water Board recognized that the decision includes significant legal or policy determinations that are likely to recur (Gov. Code §11425.60). Due to the precedent setting nature of WQ 2000-11, the Sacramento Permit must be consistent with applicable portions of the State Water Board's decision and include SUSMPs, referred to in the Sacramento program as Development Standards. More detailed information is available at the LA Regional Water Board's website:

www.swrcb.ca.gov/rwqcb4/html/programs/stormwater/la_ms4_final.html

Treatment control BMP requirements on new development and redevelopment offer the most cost-effective strategy to reduce pollutant loads to surface waters. Retrofit of existing development will be expensive and may be considered on a targeted basis. Studies on the economic impacts of watershed protection indicate that storm water quality management has a positive or at least neutral economic effect while greatly improving the quality of surface waters.³¹

²⁹ *A Watershed Approach to Urban Runoff: Handbook for Decisionmakers*, Terrene Institute and U.S. EPA Region 5 (1996). See discussion on sizing rules for water quality purposes, p 36.

³⁰ *State Water Board Order WQ 2000-11: SUSMP*; Memorandum from Chief Counsel to Regional Board Executive Officers, (December 26, 2000) discusses statewide policy implications of the decision.

³¹ *The Economics of Watershed Protection*, T. Schueler (1999), Center for Watershed Protection, Endicott, MD. The article summarizes nationwide studies to support the statement that watershed planning and storm water management provides positive economic benefits.

Status of the Sacramento Program

Since the inception of the Program in the early 1990s, the Permittees have made significant progress in controlling urban runoff pollution from new development. Among its major accomplishments, the Permittees:

- In the mid 1990s, began requiring development projects to incorporate source controls and to treat runoff using criteria such as the City and County of Sacramento's SATO methodology for sizing detention basins through the entitlement and environmental review process.
- Prepared and submitted a Development Standards Plan (DSP) on December 1, 2003.
- Adopted revised development standards in May of 2006, and began applying them to new and redevelopment projects within one year of approval of DSP by the Regional Board.
- Developed stormwater quality design standards (*Guidance Manual for On-site Stormwater Quality Control Measures, January 2000*), including methods for selecting, sizing and configuring source and treatment control measures. These standards were in place from 2000 until the new design manual was published in May 2007.
- Conducted a unique study related to the use of multi-functional drainage corridors as an alternative to conventional water quality detention basins. This study culminated in the application of new design techniques to create a vegetated water quality/flood control drainage corridor in Elk Grove that also provides habitat, recreation and community amenities.
- Partnered with Cities of Sacramento, Folsom, Rancho Cordova, Citrus Heights, Elk Grove, Galt, and Roseville to create the *Stormwater Quality Design Manual for the Sacramento and South Placer Regions*, published in May 2007. This two-year process entailed outreach to the development community and meetings with a newly formed stormwater committee of the local Building Industry Association. The manual includes selection and design criteria for source control, runoff reduction and treatment control measures.
- Amended the California Environmental Quality Act (CEQA) review process to provide additional water quality protection language in July of 2003.
- Some permittees added water quality and watershed protection principles to their General Plans during the update process.
- Conducted a study to investigate the pollutant removal performance of various proprietary structural control measures. The goal of the study

was to determine which devices are acceptable for use in the Sacramento area based on field data submitted by manufacturers. The study was updated periodically as new data became available from vendors. The results of the study were published on the Partnership's web site and referenced in the design manuals.

- Conducted several local control measure effectiveness studies and published results each year in Partnership Annual Monitoring Reports. The following studies were conducted: Inlet/In-line Control Measure Study (Fossil Filter catch basin insert and Teichert stormwater interceptor); Detention Basin Study (Brown Road); Landscape Control Measure Study (Vegetated Swale); and extensive literature review and Study Work Plan. See various annual reports for more detailed lists of accomplishments.

Discussion of Requirements in This Permit

This component of the Permit requires each Permittee to update and continue to implement the Planning and New Development Element of its SQIP to minimize the short and long-term impacts on receiving water quality from new development and redevelopment. The Permit requires the continued implementation of the Permittees' Development Standards during the entitlement and CEQA process and the development plan review process.

To address low impact development (LID) and hydromodification, this Permit requires the Permittees revise their Development Standards and associated technical guidance (a.k.a. *Stormwater Quality Design Manual*) and submit a Hydromodification Management Plan (HMP).

Status of the Sacramento Program

Since the initiation of the program in 1990, the Permittees have completed the following work:

- Established the legal authority to prohibit non-stormwater discharges and enforce those prohibitions through the adoption of local land grading and erosion control and stormwater ordinances
- Established and continued implementation of inspections, reporting procedures and enforcement to achieve compliance on construction sites.
- Conducted employee training with regard to review, inspection and enforcement
- Provided outreach and guidance to the development community through workshops and brochures on local and State requirements

- Established and maintained tracking databases and maps to assist with investigations and identification of problem areas

The Permittees are also required to revise applicable ordinances/ standards/specifications following amendment of Development Standards.

Finally, the Permit requires the performance of an assessment to determine the effectiveness of the Element activities and identification of any necessary modifications for continuous improvement.

VI. MONITORING PROGRAM

Legal Authority

Federal regulations (40 CFR 122.26(d)) require the following: (1) quantitative data from representative outfalls designated by the permitting authority, which shall designate between five and ten outfalls or field screening points as representative of the commercial, residential, and industrial land use activities of the drainage area contributing to the MS4; (2) estimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls and the event mean concentration of the cumulative discharges for constituents of concern; (3) estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of SQIP implementation; and (4) the Permittees to submit an annual report that identifies, among other things, water quality improvements or degradation. Items 1-3 are required as Part 2 of the initial application. However, since they are needed to evaluate the SQIP, they are being incorporated into this Permit.

Discussion of Requirements in this Permit

A. Urban Discharge Monitoring

Urban runoff monitoring began in 1989/90 to characterize the quality of urban runoff in the Sacramento Urbanized Area. Early urban runoff monitoring was conducted at various sites; since 1994/95, long-term urban runoff monitoring has continued at three sites – Sump 104, Sump 111 and Strong Ranch Slough. These sites characterize areas developed prior to the inception of the Permittees stormwater quality management program. The proposed Permit omits the Sump 104 monitoring requirement and requires a new sampling location in the North Natomas Development area. The basis for this change is the need to better characterize the overall Sacramento Urban Area, including areas that have been developed since the inception of the Permittees management program. The goals of this monitoring are to (1) act as a performance standard to monitor long-term trends in urban storm water

quality, (2) provide data for estimating pollutant loads discharged to receiving waters, and (3) provide periodic water quality data on non-storm water discharges from municipal separate storm sewer systems.

Prior to the previous Permit adoption, the Permittees evaluated urban runoff sampling frequency and concluded that sampling every year was not necessary in order to characterize urban runoff quality and long term trends.³² The Permittees will evaluate the effect of replacing Sump 104 monitoring with monitoring in a newly developed area (e.g., North Natomas) on the long term effectiveness evaluation.

B. Receiving Water Monitoring

The receiving water monitoring component of the Monitoring and Reporting Program (MRP) includes river monitoring stations on the American and Sacramento Rivers, and urban tributary monitoring stations on three Arcade Creek, Willow Creek, and Laguna Creek. The Laguna Creek monitoring location will replace the downstream Morrison Creek monitoring station that was used in the previous Permit. The basis for this change is the need to better characterize the overall Sacramento Urban Area, including areas that have been developed since the inception of the Permittees management program. The Laguna Creek watershed is also of interest because of its rapid development, and the potential to characterize any changes caused by development.

The American and Sacramento Rivers have two monitoring stations each. These stations are located downstream of major urban discharges on the American River and on the Sacramento River there is an upstream station and a downstream station in an effort to monitor worst-case water quality conditions for compliance with receiving water limits. Receiving water monitoring for rivers and urban tributaries is required to analyze for constituents listed in Table B, except for pyrethroids/pyrethrins pesticides in water.

In the previous Permit term, the Permittees monitored additional urban tributary locations on Chicken Ranch Slough, Elder Creek, Elk Grove Creek, and Morrison Creek as part of the "Additional Pesticide Monitoring" requirement. From the data collected, the Permittees concluded that the sites were statistically similar to at least one of the primary receiving water sites, and further monitoring of diazinon and chlorpyrifos was not necessary.³³

³² Sacramento Stormwater Quality Partnership, *Discharge Monitoring Frequency Evaluations*. November 23, 1998. Prepared by Larry Walker Associates.

³³ Sacramento Stormwater Quality Partnership, *Report of Waste Discharge: Evaluation of Additional Pesticide Monitoring Data - 2007 Update*. June 2007. Prepared by Larry Walker Associates.

Based on the outcome of the Permittees analysis of total mercury and total methyl mercury concentrations and loads in the 2008/09 annual report, additional sampling at these urban tributaries will be evaluated and reported to the Regional Water Board.

Report of Water Quality Exceedance (RWQE) preparation during the previous permit term included development of a work plan to address the cause and nature of dissolved oxygen (DO), pH, and temperature exceedances in several urban tributaries. Multiple steps in the work plan have been completed.^{34 35 36} The Permittees are required to continue to implement the work plan elements and begin Phase II upon adoption of this Permit. Much of the work shall be performed in Morrison Creek, other creeks may be identified.

C. Method Detection Monitoring

The Minimum Levels (MLs) listed in Appendix 4 of the State Board Policy for Implementation of Toxics Standards for Inland Surface Water, Enclosed Bays, and Estuaries of California, 2000 (SIP) represent the lowest quantifiable concentration in a sample based on the proper application of all method-based analytical procedures and the absence of any matrix interferences.³⁷ These MLs must be incorporated into all water quality monitoring programs to detect priority toxic pollutants. The MLs are the only established criteria that take into consideration recent improvements in chemical analytical methods. If they are not used in the storm water program, concentrations of concern for priority toxic pollutants may not be detected. Detection and control of toxic pollutants in surface waters is necessary to achieve the CWA's goals and objectives.³⁸ Numeric criteria for toxic pollutants are necessary to evaluate the adequacy of existing and potential control measures to protect aquatic ecosystems and human health.³⁹ Also, using MLs will provide quantifiable data that is necessary to better assess water quality and to develop Waste Load Allocations (WLA) and Load Allocations (LA) for TMDLs. Furthermore, non-detects cannot be used to accurately determine mass loadings. The criteria established in the CTR are

³⁴ Sacramento Stormwater Quality Partnership, September 20, 2006. Memorandum from Brian Laurenson, Larry Walker and Associates, *Assessment Strategy for Dissolved Oxygen, Temperature and pH in Sacramento Urban Tributaries*.

³⁵ Sacramento Stormwater Quality Partnership, November 13, 2006. Memorandum from Brian Laurenson, Larry Walker and Associates. *Urban Tributary Dissolved Oxygen, pH and Temperature Investigation Sampling and Analysis Plan – Phase 1*.

³⁶ Sacramento Stormwater Quality Partnership, May 2007. Memorandum from Ian Clark, Larry Walker and Associates. *Phase 1 Investigation Results – Willow Creek and Morrison Creek pH, Dissolved Oxygen, and Temperature*.

³⁷ SIP

³⁸ 65 Fed. Reg. 31683

³⁹ *Id.*

legally applicable in the State of California for inland surface waters, enclosed bays and estuaries for all purposes and programs under the CWA.⁴⁰ Section 402(p)(3)(B)(iii) gives U.S. EPA and states the authority to incorporate appropriate water quality-based effluent limitations in NPDES permits for discharges from MS4s.⁴¹

D. Water Column Toxicity Monitoring

Water column toxicity testing is used to determine if samples can support specific species of aquatic life compared to control samples of laboratory water. Water column toxicity can be used as an indicator of a receiving water's condition along with other important indicators (benthic bioassessment, habitat assessment, sediment, and water column quality). In properly designed studies, water column toxicity results can be used as indicators of the impact of urban runoff on receiving waters. The Center for Watershed Protection rated toxicity testing as a "very useful" indicator for assessing municipal storm water programs.^{42 43} Managers can use the results of toxicity testing to identify areas of high concern and to establish priority locations for BMPs. Furthermore, Toxicity Identification Evaluations (TIEs) and Toxicity Reduction Evaluations (TREs) can be used to identify specific pollutants and their sources so that management actions can be more specifically prioritized.

Overall, the toxicity monitoring program will assist, along with other elements of the monitoring program, in evaluating the impact of storm water on the overall quality of aquatic systems and the general health of receiving waters. When significant aquatic life toxicity is observed, water column toxicity data can be used to further identify the cause of toxicity. Water column quality monitoring alone does not necessarily reveal the impacts of storm water on aquatic life or beneficial uses of water bodies. Therefore, toxicity monitoring is a necessary component of a storm water monitoring program.

E. Water Quality Based Programs

In the last Permit period the Permittees performed additional pesticide monitoring to compare diazinon and chlorpyrifos concentrations in several additional urban tributaries to three "primary" urban tributaries. The Permittees determined that the three primary sites adequately characterized diazinon and chlorpyrifos urban tributary concentrations for the additional downstream (of urbanized areas) sites. The MRP with this Permit includes an

⁴⁰ 65 Fed. Reg. 31682

⁴¹ 65 Fed. Reg. 31703

⁴² Center for Watershed Protection, *Environmental Indicators to Assess Stormwater Control Programs and Practices*. 1996.

⁴³ Ibid.

assessment of total mercury and methylmercury to be submitted to the Regional Water Board as part of the 2008/09 Annual Report. The recommendations of that report will evaluate the need for monitoring at additional urban tributary monitoring sites.

Mercury:

Urban runoff from the Sacramento Area contributes total (inorganic) mercury and methylmercury to these mercury-impaired water bodies. Methylmercury and total mercury monitoring has taken place at three pump outfalls and three urban creeks – Strong Ranch Slough, Sump 104, Sump 111, Arcade Creek, Morrison Creek, and Willow Creek – which averaged 0.48, 0.24, 0.26, 0.9, 0.5, 0.5 ng/L methylmercury, respectively, and 59, 15, 23, 51, 27, and 53 ng/L total mercury, respectively (Laurenson, 2007⁴⁴). The Sacramento River at Freeport has an average methylmercury concentration of 0.11 ng/L, and an average total mercury concentration of 8.3 ng/L (Wood et al., 2008⁴⁵). Urban runoff from the Sacramento Area contributes about 1% of all Delta methylmercury inputs and about 3% of average Sacramento River methylmercury loads (Wood et al., 2008). Sacramento Area urban runoff methylmercury loadings directly to the lower American River and Lake Natomas have not been calculated but are a high priority to determine as part of their TMDL development effort. The lower American River watershed downstream of Lake Natoma falls entirely within Sacramento County and about 75% of the watershed has been urbanized.

A Delta mercury control program will be in effect after the Central Valley Water Board adopts Basin Plan amendments to establish a Delta mercury control program during this fourth term of the Phase I permit. The goal of the mercury control program is to reduce methylmercury exposure to humans and wildlife in the Delta. Development of mercury control programs for the Sacramento River, American River, and Lake Natoma will begin once a mercury control program for the Delta has been adopted.

The Permittees identified mercury as a top ranked target pollutant in 2002. The Permittees submitted to the Regional Water Board a Mercury Plan in 2004 that outlined the Permittees' strategy to reduce mercury in Sacramento area urban runoff. The Mercury Plan also included background information on mercury pollution in local waters, a summary of key regulations, and a description of related mercury control efforts and studies. Adequate progress was made on all Mercury Plan commitments during the third permit term.

⁴⁴ Laurenson, B.M. 2007. *Report of Waste Discharge – Discharge and Receiving Water Characterization. Memorandum and summary statistics* prepared by Brian M. Laurenson, P.E. (Larry Walker Associates) for Delia McGrath (City of Sacramento) and Janet Parris (Sacramento County).

⁴⁵ Wood, M.L., C.G. Foe, J. Cooke, S.J. Louie, and D.H. Bosworth. 2008. *Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury – Draft Report for Public Review*. Central Valley Regional Water Quality Control Board staff report, February 2008.

Mercury Product Use Survey (Mercury Survey) results were summarized in a 2005 technical memorandum that indicated that the largest volume of readily breakable mercury-containing products are lamps, with fluorescent lamps constituting the most numerous type of lamp. According to the 2005 memorandum, the Mercury Survey either documented or initiated conformance with the Universal Waste Rule (UWR), which prohibits disposal of mercury-containing products as solid waste and specifies acceptable handling and recycling/disposal requirements. The memorandum concluded that establishing procedures in conformance with the UWR addresses the previous Permit's requirement to develop and adopt policies, procedures, and/or ordinances to establish or improve proper handling and disposal of mercury-containing products.

Fluorescent lamp recycling options were evaluated in the "Sacramento Countywide U-Waste Collection Strategy Letter Report" by R3 Consulting Group Inc. (R3), which was engaged by the Sacramento County (County) Department of Waste Management and Recycling to assist with the development of a Countywide universal waste (U-waste) management strategy. The strategy is intended to specifically address the collection and management of household batteries (rechargeable and alkaline) and fluorescent and other mercury-containing lamps.

One of the goals of the urban discharge monitoring is to act as a performance standard to monitor long-term trends in urban storm water quality and evaluate BMP effectiveness in removing pollutants. This Permit requires that an evaluation of the long-term trends in MS4 discharges and receiving water quality be included in the final Annual Report for this permit term. Several factors need to be considered when evaluating trends, such as changes in sample collection methods, data quality differences, and changes in analytical methods.

A number of factors could affect the trend analysis for total mercury alone. Prior to October 1996, USEPA methods 7470 and 245.1 were used to analyze urban discharge samples for total mercury. Unlike USEPA method 1631, the analytical method used since 1996, these methods do not incorporate "clean hands" methods and have much higher detection limits and potential for high total mercury values due to un-identified cross-contamination. In addition, prior to October 1996, a combination of sampling methods – grab, three-sample composites, and partial storm/time composite samples – were used, while only grab sampling was used after 1996. Also, early 1990's data include multiple samples per storm, which, if all are included in the analysis, could result in a high bias in average and median total mercury concentrations for earlier periods.

F. Bioassessment

Monitoring and Reporting Program Order No. R5-2002-0181 required the Permittees to perform bioassessment at selected sites upstream and downstream of major discharge points from 2003 through 2007. The purpose of the bioassessment requirement was to assess the biological integrity of receiving waters, detect biological responses to pollution, identify probable causes of impairment not detected by chemical and physical water quality analysis, and provide a more holistic approach to evaluating processes of the waterways for designing effective BMPs. Four years of collected data, two years at each site every other year, have been fully evaluated and provide a limited assessment of overall biological response. Additional time is needed in order to fully evaluate biological information collected to date, so that future monitoring can be adapted to continue assessment of biological integrity of receiving water, while linking more directly with the statewide Surface Water Ambient Monitoring Program's (SWAMP's), long term goal of utilizing bioassessment to develop biocriteria for a variety of eco-regions and land-use dominated areas in California. Further bioassessment monitoring activities will not be required under this proposed Permit. If it is required in the future, the monitoring effort will be adapted in consultation with the SWAMP's bioassessment workgroup.

G. Sediment Monitoring

Ambient water and sediment quality monitoring by the Surface Water Ambient Monitoring Program (SWAMP - Sacramento Basin) identified a high incidence of sediment toxicity in several urban creeks that drain the suburbs of Roseville (Weston et al., 2005).⁴⁶ Nearly all creek sediments sampled caused toxicity to the resident aquatic amphipod *Hyalella azteca*, and about half the samples (10 of 21) caused nearly complete mortality (>90%). Another study by the Sacramento River Watershed Program (SRWP) observed sediment toxicity in almost every Sacramento area urban creek that was tested (Amweg et al., 2006).⁴⁷ Several pyrethroid pesticides were present in sediment samples from both studies at acutely toxic concentrations. Pyrethroid pesticides are persistent, hydrophobic, and rapidly sorb to sediments in aquatic environments. The sediment toxicity observed was localized to within tens to hundreds of meters downstream of storm water outfalls draining residential areas.

The phase-out of the sale of diazinon and chlorpyrifos for most residential and commercial uses resulted in an increase in the use of pyrethroid pesticide use

⁴⁶ Weston, D.P., R.W. Holmes, J. You, and M.J. Lydy. 2005. Aquatic toxicity due to residential use of pyrethroid insecticides. *Environ. Sci. & Technol.* 39: 9778-9784.

⁴⁷ Amweg, E.L., D.P. Weston, J. You, and M.J. Lydy. 2006. Pyrethroid insecticides and sediment toxicity in urban creeks from California and Tennessee. *Environ. Sci. & Technol.* Published on web 1/31/2006.

in urban and residential areas. Monitoring of sediment quality and urban runoff/discharges is needed to characterize sediment/water quality conditions, determine the significance of the increase in urban pyrethroid usage, and assess management practice effectiveness.

VII. BMP Effectiveness Study

The BMP Effectiveness Study is an integral part of the storm water monitoring program. It is necessary to document the effectiveness of treatment control BMPs so that each Permittee can make informed decisions on the use of BMPs.

Wet Detention Basin Monitoring

The Permittees shall complete the Water Quality Detention Basin Effectiveness study initiated in the last permit term to assess the pollutant removal performance of a representative wet water quality detention basin. The study shall be designed to perform inflow and outflow monitoring to measure removal effectiveness, which is representative of typical conditions within the Sacramento urban watershed. The report shall include a recommendation for collecting inlet and outlet grab samples at two other detention basins. The two additional detention basins shall be located in watersheds outside the North Natomas area. The results will be submitted to the Regional Water Board in the 2012/2013 Annual Report.

If the detention basins are found to be ineffective, the study shall be updated to include recommendations on how to manage or design detention basins differently (i.e., redesign new basins, reconfigure existing basins, periodic dredging).

VIII. Program Effectiveness Assessment

The proposed Permit requires the Permittees to provide an analysis of the effectiveness of their SQIP in their Annual Reports. The assessment will identify the direct and indirect measurements that the Permittees used to track the effectiveness of their programs as well as the outcome levels at which the assessment is occurring consistent with the proposed Permit. Direct and indirect measurements shall include, but not limited to, conformance with established Performance Standards, quantitative monitoring to assess the effectiveness of Program Elements, measurements or estimates of pollutant load reductions or increases from identified sources, raising awareness of the public, and/or detailed accounting/ documentation of SQIP accomplishments.

- a. The Permittees will be required to track the long-term progress of their SQIP towards achieving improvements in receiving water quality.
- b. The Permittees will be required to use the information gained from the program effectiveness assessment to improve their SQIPs and identify new

BMPs, or modification of existing BMPs. This information shall be reported within the Annual Reports consistent with this Permit.

Long Term Effectiveness Assessment (LTEA): Prior to the expiration of the Permit, the Permittees will collaborate to conduct a LTEA which will build on the results of the Annual Reports and the initial program effectiveness assessments. The LTEA will identify how the Permittees will conduct a more comprehensive effectiveness assessment of the storm water program as part of the SQIP. The assessment will evaluate the storm water program in terms of achieving both programmatic goals (raising awareness, changing behavior) and environmental goals (reducing pollutant discharges, improving environmental conditions).